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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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00/383,725 05/10/00 HOLMSTROM

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MMO2/1015
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EXAMINER

ENAD, E

ART UNIT

PAPER NUMBER

2834

DATE MAILED:

10/15/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/355,729

Applicant(s)

Holmstrom et al.

Examiner

Elvin Enad

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Jul 12, 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-46 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25-30 and 34-46 is/are rejected.
- 7) ☒ Claim(s) 31-33 is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892) 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 19) ☐ Notice of Informal Patent Application (PTO-152)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____ 20) ☐ Other: _____

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DETAILED ACTION

Information Disclosure Statement

1. Receipt is acknowledged of the information disclosure statement papers filed on January 17, 2001. The papers have been placed in the application file. A signed copy of the IDS will be provided when application is allowed.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 25-30,34 and 43-45 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Shildneck (USP 3,014,139) in view of Balke (USP 2,778,964).

Shildneck discloses the machine essentially as claimed except for providing cuff means at the end surface of the stator slots.

Balke teaches that it is known to provide an insulating assembly for the stator slots comprised of a slot liner made of a resilient insulating material.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have provided cuff means as disclosed by Balke to the stator slots of Shildneck, since such a modification according to Balke in column 2, lines 70-72 to column 3, lines 1-7 would provide support and prevent undesirable axial movement of the winding and provide

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insulation between the edge of the slot and the end turns of the coils within the slot. Moreover, Balke discloses his cuffs 15 is optional contingent upon the design requirements.

4. Claims 35,37,41 and 42 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Shildneck (USP 3,014,139) in view of Balke (USP 2,778,964) and further in view of Elton ('565).

Shildneck and Balke disclose the claimed invention except for having the stator winding comprised of semiconducting layers.

Elton ('565) discloses a cable with stranded conductors surrounded by a first inner semiconducting insulation layer (104), an intermediate solid insulation layer (106) and an outer semiconducting insulation layer (110) which is connected to ground. Such an arrangement, as disclosed by Elton helps to prevent corona discharge between the cable and the surrounding elements.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have provided in the machine of Shildneck a cable comprising an inner layer having semiconducting properties, an insulating layer surrounding the inner layer and an outer layer having semiconducting properties, as disclosed by Elton ('565) in order to prevent corona discharge from the winding.

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5. Claim 36 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Shildneck (USP 3,014,139) in view of Balke (USP 4,161,669) and Elton ('565) and further in view of Takaoka.

Shildneck, Balke and Elton ('565) disclose the claimed invention except for utilizing a particular cable diameter and conducting area.

Takaoka et al. in column 1, lines 22-29 teach that the selection of the particular diameter of the conductor size is contingent upon the amount of power that is transmitted.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have use a conductor as disclosed by Shildneck and Elton having a diameter similar to that as claimed by applicant, since according to Takaoka, the selection of the particular cable diameter is contingent upon the amount of power desired to be transmitted. Moreover, it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. ***In re Aller*, 105 USPQ 233**

6. Claims 38 and 40 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Shildneck (USP 3,014,139) in view of Balke (USP 4,161,669) and Elton ('565) and further in view of Elton ('116).

Shildneck, Balke and Elton ('565) disclose the claimed invention except for the semiconducting layers having the same coefficients of thermal expansion.

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Elton ('116) teaches that it is well known to form different overlapping insulations with the same coefficient of thermal expansion in order to prevent thermal stress to separate and crack the materials to cause failure of the insulation (see lines 38-44, col.7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to have formed the semiconducting layers and insulation of Shildneck and Elton ('565) such that the different layers of insulation had similar or the same coefficient of thermal expansion, as disclosed by Elton ('116), in order to prevent failure caused by thermal aging and cycling.

7. Claim 39 and 46 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Shildneck (USP 3,014,139) in view of Balke (USP 4,161,669) and Elton ('565) and Haxton.

Shildneck, Balke and Elton ('565) disclose the claimed invention except for the material of the cable layers having a modulus of elasticity less than 500 Mpa.

Haxton teaches that it is known to form the inner sheath **6** and outer sheath **11** of a high voltage cable having modulus of elasticity from 90 Mpa to 600 Mpa.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have selected a cable with modulus of elasticity similar to that as taught by Haxton since according to Haxton such a modification would provide a cable that is highly flexible having lower minimum bend radius.

Allowable Subject Matter

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8. Claims 31-33 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

9. Applicant's arguments filed on July 12, 2001, have been fully considered but they are not persuasive. In response, applicant canceled claims 1-20 and 22-24 and added new claims 25-46. Applicant provided various arguments as to why the combination of the cited references, e.g., Shildneck, Balke, Elton and Takaoka are not obvious, since the references fail to teach or suggest motivations to combine. In particular, applicant argues that Shildneck is not intended for high voltage applications, since Shildneck uses a thin layer of rubber insulation and wants to reduce the thickness of the cable ground insulation.

Examiner disagrees with applicant's conclusion. First, it should be understood clearly that applicant in page 1, lines 24-28 defines 'high voltage' application in rotating electric machines as any voltages exceeding 10kV, with operating range from 36-800 kV. While Shildneck does not specify the operating voltage range for his generator, the specification clearly teaches his generator is designed for high voltage application. Beginning in column 1, line 1 through column 2, lines 21-39, Shildneck devotes the section discussing the advantage and disadvantages of using rectangular cross-section conductor bars as windings for conventional large capacity turbine-generators. According to Shildneck, the conductor bars are heavy and either semi-rigid or rigid making them difficult to wind and costly to manufacture. In light of the disadvantages, Shildneck,

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in lines 39-41, teaches employing a flexible conductor instead of rectangular conductor bars for winding. (As commonly known and admitted by applicant, conventional high-voltage generators use rectangular conductor bars for high voltage applications).

In response to applicant's argument that Shildneck has a reduced thickness of ground insulation, examiner contends that this is due to his improved cable winding. According to Shildneck in column 2, lines 59-61, a thinner insulation could be used due to uniform dielectric stress. In column 6, lines 32-34, Shildneck teaches that by using a flexible conductor, the small-radius bends in the ground insulation are eliminated, (required at the corners of rectangular conductors), resulting in a lower dielectric stress existing across the ground insulation. Thus, his cable allows the use of thinner insulation for the same electrical voltage to ground.

Applicant asserts that Elton does not disclose a cable winding for a machine, that Elton discloses a conventional rigid winding bar with a pyrolyzed glass outer covering, and a transmission and distribution cable with similar covering. Applicant further argues that these are separate applications utilizing a common component and that Elton does not teach the cable and the winding to be interchangeable.

As described in the preceding paragraphs, Shildneck clearly teaches the use of a flexible cable in a high voltage electromagnetic device. The question to ask regarding Elton would be if one of ordinary skill in the art would be motivated to apply the teachings of Elton and use the semi-conducting pyrolyzed glass fiber material for improvement to the flexible cable winding of an electromagnetic device, such as Shildneck.

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It is important to note that Elton in column 3, line 63 through column 4, line 10, discloses two important properties of the semi-conducting pyrolyzed glass fiber material, that it has a resistivity of a good insulator as well as of a good conductor. Figure 7 of Elton illustrates a cable utilizing the semi-conducting pyrolyzed glass fiber material to equalize the electric charge on the exterior of the insulator of the cable and an internal semi-conducting pyrolyzed glass fiber layer which equalizes the electric charge about the conductive strands. The covering of the insulated electrical conductor by a semi-conducting pyrolyzed glass fiber material prohibits the development of corona discharge. As commonly known and recognized by Elton, the problem of corona discharge in dynamo electric machines with high voltage applications is ever present. Accordingly, one of ordinary skill in the art would have been motivated to provide the machine of Shildneck a cable similar to that of Elton comprising layers having semiconducting properties, such as an insulating layer surrounded by an inner layer and an outer layer having semiconducting properties since this arrangement would prevent corona discharge from the winding.

Examiner disagrees with applicant's argument that the cable of Elton et al. ('565) is stiff due to the presence of the semiconducting layer made of pyrolyzed glass layer. The rigidity of a conductor cable primarily depends on the type of insulation used. Shildneck for instance, in column 2, lines 28-30 teaches that the rigidity of the conductor bars depend on the type of insulation used. Shildneck uses silicone-rubber insulation for his flexible cable. Moreover, as is known in power cables, cable flexibility primarily depends upon the use of ethylene-propylene (EPM) and ethylene-propylene-diene (EPDM) rubbers as insulation rather than of the semi-

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conducting layer. In addition, Elton et al. ('565) in column 8, lines 3-9, teach that the semi-conducting pyrolyzed glass layer can be chopped, mixed with resin and molded or blown on any complex shaped substrate so that the layer can be placed in intimate contact with substantially all of the exterior surface of the insulator or housing. As such, the semi-conducting layer can be shaped or molded according to design, in this instance, with a cable without causing cable rigidity.

Applicant attacks the specific structure of the stator of the Shildneck such that if the entire cable of Elton would be substituted for the entire cable structure of Shildneck, the arrangement would be unsatisfactory. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's argument against the combination of Shildneck, Elton and Takaoka, with Takaoka teaching having a combination of insulated and uninsulated conductor strands for preventing skin effect losses, while applicant's purpose is to reduce eddy current loss, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

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Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for response to this final action is set to expire THREE MONTHS from the date of this action. In the event a first response is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for response expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elvin Enad whose telephone number is (703) 308-7619. The examiner can normally be reached on Monday-Friday from 8:00AM to 4:00PM.

12. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nestor Ramirez, can be reached on (703) 308-1371. The fax phone number for this Tech Center group is (703) 305-3431(32).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.



Elvin Enad
Primary Examiner
Art Unit 2834
10.12.2001